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EXAMINER

SUCH, MATTHEW W

ART UNIT	PAPER NUMBER
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2891

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/570,839

Applicant(s)

DOLL ET AL.

Examiner

MATTHEW W. SUCH

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2, 13 and 19-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2, 13 and 26 is/are allowed.
- 6) ☒ Claim(s) 19-25 and 27-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>28 December 2010</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 28 December 2010 is being considered by the examiner.

Claim Objections

2. Claim 30 is objected to because of the following informalities: the phrase "transparent organic substrate" in Line 2 should read "transparent substrate". Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 19-25 and 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang (‘155) in view of Mizusaki (WO ‘640; supplied with Office Action dated 11 September 2009) in view of Hirai (‘900).

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a. Regarding claim 19, Huang teaches an electronic component with closely adjacent electrodes comprising a substrate (Element 12 in Fig. 13), a first electrode (Element 14 in Fig. 13) which has a first thickness on the substrate, a second electrode (Element 16 in Fig. 13) which has a second thickness on the substrate, a third electrode (Element 22, 34 in Fig. 13) which has a third thickness in a hole (Element 24 in Fig. 13) in the substrate. A first edge of the third electrode is aligned with an edge of the first electrode and a second edge of the third electrode is aligned with an edge of the second electrode (see Fig. 13). An insulator (Element 30 in Fig. 13) is on the third electrode. An organic semiconductor (Element 28 in Fig. 13) is on the first electrode, the second electrode and the insulator.

While Huang teaches that the gap between the first and second electrodes are less than 1 micron (see Para. 0035, Lines 5-8) and that the transistors have short channel lengths (see Para. 0074), there is no explicit teaching that the separation between the first and second electrodes is about ten nanometers. However, Mizusaki teaches an organic transistor with the channel length being on the nanometer scale such as 1-20 nm (Page 51, Lines 5-8 and 12-13), and as such the distance between the first and second electrodes being 1-20 nm. It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the channel length and hence distance between the first and second electrodes to be about 10 nm. One would have been motivated to do so since Mizusaki teaches that a transistor having such dimensions in the nanometer range, including 10 nm, provides greatly improved characteristics compared to conventional transistors. It has been held that where the general conditions of a claim are disclosed in

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prior art, discovering the optimum value involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See MPEP § 2144.05.

Huang does not teach that a sealing layer is on the organic semiconductor. However, Hirai teaches a bottom gate transistor with a sealing layer (Element 4 in Fig. 2) on the organic semiconductor (Element 3 in Fig. 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a sealing layer on the organic semiconductor as taught by Hirai in the device of Huang. One would have been motivated to do so since Hirai teaches that the sealing layer protects and stabilizes the organic semiconductor and its contact to the source and drain electrodes (see Col. 7, Lines 24-30) and deterioration of the organic semiconductor due to light can be suppress (see Col. 8, Lines 45-47).

While Huang teaches that the thickness of the first, second, and third electrodes are the same since they are formed of the same starting layer (Element 20), there is no teaching that the first and second thicknesses are at least approximately twice the third thickness. However, once the sealing layer of Hirai is added to the device, Hirai shows that the source and drain electrodes (Elements "S" and "D" in Fig. 2) extend through the organic semiconductor layer and the sealing layer. It is noted that the source and drain electrodes of Hirai correspond to the first and second electrodes of Huang. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the first and second electrode (the source/drains) to be thicker than the third electrode (the gate electrode) thick in the device of Huang. One would have been motivated to do so in order to allow for the source and drain electrodes to protrude from

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the substrate surface up through the organic semiconductor layer formed thereon as well as up through the sealing layer thereby enabling electrical connection to the outside, as shown by Hirai (see Hirai Fig. 2).

b. Regarding claim 20, Huang teaches that the substrate comprises a polymer film (see Para. 0023, for example).

c. Regarding claim 21, while Huang teaches that the first electrode comprises silver, as one example among a wide variety of suitable materials (see Para. 0025), there is no explicit teaching of using, for example, gold.

However, Hirai teaches using either silver or gold for a first electrode (a source electrode) in an organic transistor (see Col. 16, Lines 13-14). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use gold as the first electrode as taught by Hirai in the device of Huang. One would have been motivated to do so since Hirai teaches that gold and silver are functionally equivalent as source electrodes for organic transistors (see Col. 16, Lines 13-14) and are, in fact, each preferred materials (see Col. 16, Lines 26-27). It has been held that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

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d. Regarding claim 22, while Huang teaches that the third electrode comprises silver, as one example among a wide variety of suitable materials (see Para. 0025), there is no explicit teaching of using, for example, gold.

However, Hirai teaches using either silver or gold for a third electrode (a gate electrode) in an organic transistor (see Col. 16, Lines 13-14). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use gold as the third electrode as taught by Hirai in the device of Huang. One would have been motivated to do so since Hirai teaches that gold and silver are functionally equivalent as gate electrodes for organic transistors (see Col. 16, Lines 13-14) and are, in fact, each preferred materials (see Col. 16, Lines 26-27). It has been held that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

e. Regarding claim 27, the language of the claim is directed towards the process of making the electronic component of claim 19. It is well settled that "product by process" limitations in claims drawn to structure are directed to the product, per se, no matter how actually made. *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also, *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wethheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); *In re Marosi et al.*, 218 USPQ 289; and particularly *In re Thorpe*, 227 USPQ 964, all of

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which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or otherwise. The above case law further makes clear that applicant has the burden of showing that the method language necessarily produces a structural difference. As such, the language claim 27 only requires the structure of the electronic device of claim 19, which does not distinguish the invention from Huang in view of Mizusaki in view of Hirai, who teaches the structure as claimed. The claim does not add any additional structural features to the final device that are not already set forth by claim 19.

f. Regarding claim 23, Huang teaches an electronic component with closely adjacent electrodes comprising a substrate (Element 12 in Fig. 13) which includes glass other than SiO₂, such as the Tg polymer materials set forth (see Para. 0047-0055 and Table 1), a first electrode (Element 14 in Fig. 13) which has a first thickness on the substrate, a second electrode (Element 16 in Fig. 13) which has a second thickness on the substrate, a third electrode (Element 22, 34 in Fig. 13) which has a third thickness in a hole (Element 24 in Fig. 13) in the substrate. A first edge of the third electrode is aligned with an edge of the first electrode and a second edge of the third electrode is aligned with an edge of the second electrode (see Fig. 13). An insulator (Element 30 in Fig. 13) is on the third electrode. An organic semiconductor (Element 28 in Fig. 13) is on the first electrode, the second electrode and the insulator.

While Huang teaches that the gap between the first and second electrodes are less than 1 micron (see Para. 0035, Lines 5-8) and that the transistors have short channel lengths (see Para. 0074), there is no explicit teaching that the separation between the first and second electrodes is about ten nanometers. However, Mizusaki teaches an organic transistor with the channel length being on the nanometer scale such as 1-20 nm (Page 51, Lines 5-8 and 12-13), and as such the distance between the first and second electrodes being 1-20 nm. It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the channel length and hence distance between the first and second electrodes to be about 10 nm. One would have been motivated to do so since Mizusaki teaches that a transistor having such dimensions in the nanometer range, including 10 nm, provides greatly improved characteristics compared to conventional transistors. It has been held that where the general conditions of a claim are disclosed in prior art, discovering the optimum value involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See MPEP § 2144.05.

Huang does not teach that a sealing layer is on the organic semiconductor. However, Hirai teaches a bottom gate transistor with a sealing layer (Element 4 in Fig. 2) on the organic semiconductor (Element 3 in Fig. 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a sealing layer on the organic semiconductor as taught by Hirai in the device of Huang. One would have been motivated to do so since Hirai teaches that the sealing layer protects and stabilizes the organic semiconductor and its contact to the source and drain electrodes (see Col. 7,

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Lines 24-30) and deterioration of the organic semiconductor due to light can be suppress (see Col. 8, Lines 45-47).

While Huang teaches that the thickness of the first, second, and third electrodes are the same since they are formed of the same starting layer (Element 20), there is no teaching that the first and second thicknesses are at least approximately twice the third thickness. However, once the sealing layer of Hirai is added to the device, Hirai shows that the source and drain electrodes (Elements "S" and "D" in Fig. 2) extend through the organic semiconductor layer and the sealing layer. It is noted that the source and drain electrodes of Hirai correspond to the first and second electrodes of Huang. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the first and second electrode (the source/drains) to be thicker than the third electrode (the gate electrode) thick in the device of Huang. One would have been motivated to do so in order to allow for the source and drain electrodes to protrude from the substrate surface up through the organic semiconductor layer formed thereon as well as up through the sealing layer thereby enabling electrical connection to the outside, as shown by Hirai (see Hirai Fig. 2).

g. Regarding claim 24, while Huang teaches that the first electrode comprises silver, as one example among a wide variety of suitable materials (see Para. 0025), there is no explicit teaching of using, for example, gold.

However, Hirai teaches using either silver or gold for a first electrode (a source electrode) in an organic transistor (see Col. 16, Lines 13-14). It would have been obvious

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to one of ordinary skill in the art at the time the invention was made to use gold as the first electrode as taught by Hirai in the device of Huang. One would have been motivated to do so since Hirai teaches that gold and silver are functionally equivalent as source electrodes for organic transistors (see Col. 16, Lines 13-14) and are, in fact, each preferred materials (see Col. 16, Lines 26-27). It has been held that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

h. Regarding claim 25, while Huang teaches that the third electrode comprises silver, as one example among a wide variety of suitable materials (see Para. 0025), there is no explicit teaching of using, for example, gold.

However, Hirai teaches using either silver or gold for a third electrode (a gate electrode) in an organic transistor (see Col. 16, Lines 13-14). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use gold as the third electrode as taught by Hirai in the device of Huang. One would have been motivated to do so since Hirai teaches that gold and silver are functionally equivalent as gate electrodes for organic transistors (see Col. 16, Lines 13-14) and are, in fact, each preferred materials (see Col. 16, Lines 26-27). It has been held that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S.

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327, 65 USPQ 297 (1945). See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

i. Regarding claim 28, the language of the claim is directed towards the process of making the electronic component of claim 23. It is well settled that "product by process" limitations in claims drawn to structure are directed to the product, per se, no matter how actually made. *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also, *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wethheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); *In re Marosi et al.*, 218 USPQ 289; and particularly *In re Thorpe*, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or otherwise. The above case law further makes clear that applicant has the burden of showing that the method language necessarily produces a structural difference. As such, the language claim 28 only requires the structure of the electronic device of claim 23, which does not distinguish the invention from Huang in view of Mizusaki in view of Hirai, who teaches the structure as claimed. The claim does not add any additional structural features to the final device that are not already set forth by claim 23.

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5. Claims 29-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klauk ('426) in view of Mizusaki (WO '640; supplied with Office Action dated 11 September 2009) in view of Sirringhaus ('987) in view of Goodman (Phys. Rev., Vol. 144; supplied as evidence of material properties).

j. Regarding claim 29, Klauk teaches an electronic component comprising first and second electrodes (Elements 11 and 12 in Fig. 3D) positioned apart on a substrate (Element 7 in Fig. 3D). An organic semiconductor (Element 13 in Fig. 3D) is on the first and second electrodes. A transparent insulator (Element 8 in Fig. 3D) of silicon dioxide (Para. 0059, Lines 16-17) is on the organic semiconductor. A third electrode (Element 6 in Fig. 3D) is on the transparent insulator. A first edge of the third electrode is aligned with an edge of the first electrode and a second edge of the third electrode is aligned with an edge of the second electrode (see Fig. 3D).

Goodman evidences that silicon dioxide is transparent (see Page 590, Right Col., Line 2).

Klauk does not teach that the separation between the first and second electrodes is about ten nanometers. However, Mizusaki teaches an organic transistor with the channel length being on the nanometer scale such as 1-20 nm (Page 51, Lines 5-8 and 12-13), and as such the distance between the first and second electrodes being 1-20 nm. It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the channel length and hence distance between the first and second electrodes to be about 10 nm. One would have been motivated to do so since Mizusaki teaches that a

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transistor having such dimensions in the nanometer range, including 10 nm, provides greatly improved characteristics compared to conventional transistors. It has been held that where the general conditions of a claim are disclosed in prior art, discovering the optimum value involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See MPEP § 2144.05.

While Klauk suggests using transparent substrates for organic transistors, particular for displays (Para. 0012, Line 17), there is no explicit teaching that the substrate used is transparent. However, Sirringhaus teaches using transparent substrates (Para. 0151). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a transparent substrate as taught by Sirringhaus as the substrate of Klauk. One would have been motivated to do so since Sirringhaus teaches that transparency is advantageous so that the device can be used in displays (see Para. 0160) and Klauk teaches that transparent substrates are advantageous for being used in displays (see Para. 0012).

While Klauk teaches, for example, organic semiconductors for transistors in display applications (see Para. 0012), there is no explicit teaching that the organic semiconductor used is transparent. However, Sirringhaus teaches using transparent organic semiconductor materials for transistors in display applications (see Para. 0160). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a transparent organic semiconductor as taught by Sirringhaus in the device of Klauk. One would have been motivated to do so since Sirringhaus teaches that

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transparent organic semiconductors have the advantage of not adsorbing optical light and have reduced photosensitivity, thereby preventing a large OFF current (see Para. 0161).

k. Regarding claim 30, Klauk teaches that the substrate is a polymer (see Para. 0059, Lines 6-10).

l. Regarding claims 31-33, Klauk teaches that the contacts, which includes the first, second and third electrodes include conductive metals (see Para. 0059) and teaches a non-limiting example of aluminum for this purpose (see Para. 0059, Lines 12-14 and 41-44) without explicitly teaching gold as the material in the first, second and third electrodes. However, Klauk also teaches that gold and aluminum are functionally equivalent conductive metals for contacts (see Para. 0043). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use gold as the first, second and third electrodes since Klauk teaches that these materials are functionally equivalent to aluminum as conductive metals for contacts. It has been held that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

m. Regarding claims 34 and 35, the language of the claim is directed towards the process of making the electronic component of claim 29. It is well settled that "product

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by process" limitations in claims drawn to structure are directed to the product, per se, no matter how actually made. In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also, In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 161; In re Wethheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); In re Marosi et al., 218 USPQ 289; and particularly In re Thorpe, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or otherwise. The above case law further makes clear that applicant has the burden of showing that the method language necessarily produces a structural difference. As such, the language claims 34 and 35 only requires the structure of the electronic device of claim 29, which does not distinguish the invention from Klauk in view of Mizusaki in view of Sirringhaus in view of Goodman, who teaches the structure as claimed. The claim does not add any additional structural features to the final device that are not already set forth by claim 29.

n. Regarding claim 38, Klauk teaches an electronic component comprising first and second electrodes (Elements 11 and 12 in Fig. 3D) positioned apart on a substrate (Element 7 in Fig. 3D). The substrate includes glass (Para. 0059, line 11). An organic semiconductor (Element 13 in Fig. 3D) is on the first and second electrodes. A transparent insulator (Element 8 in Fig. 3D) of silicon dioxide (Para. 0059, Lines 16-17) is on the organic semiconductor. A third electrode (Element 6 in Fig. 3D) is on the

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transparent insulator. A first edge of the third electrode is aligned with an edge of the first electrode and a second edge of the third electrode is aligned with an edge of the second electrode (see Fig. 3D).

Goodman evidences that silicon dioxide is transparent (see Page 590, Right Col., Line 2).

Klauk does not teach that the separation between the first and second electrodes is about ten nanometers. However, Mizusaki teaches an organic transistor with the channel length being on the nanometer scale such as 1-20 nm (Page 51, Lines 5-8 and 12-13), and as such the distance between the first and second electrodes being 1-20 nm. It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the channel length and hence distance between the first and second electrodes to be about 10 nm. One would have been motivated to do so since Mizusaki teaches that a transistor having such dimensions in the nanometer range, including 10 nm, provides greatly improved characteristics compared to conventional transistors. It has been held that where the general conditions of a claim are disclosed in prior art, discovering the optimum value involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See MPEP § 2144.05.

While Klauk suggests using transparent substrates for organic transistors, particular for displays (Para. 0012, Line 17), there is no explicit teaching that the substrate used is transparent. However, Sirringhaus teaches using transparent substrates (Para. 0151). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a transparent substrate as taught by Sirringhaus as the

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substrate of Klauk. One would have been motivated to do so since Sirringhaus teaches that transparency is advantageous so that the device can be used in displays (see Para. 0160) and Klauk teaches that transparent substrates are advantageous for being used in displays (see Para. 0012).

While Klauk teaches, for example, organic semiconductors for transistors in display applications (see Para. 0012), there is no explicit teaching that the organic semiconductor used is transparent. However, Sirringhaus teaches using transparent organic semiconductor materials for transistors in display applications (see Para. 0160). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a transparent organic semiconductor as taught by Sirringhaus in the device of Klauk. One would have been motivated to do so since Sirringhaus teaches that transparent organic semiconductors have the advantage of not adsorbing optical light and have reduced photosensitivity, thereby preventing a large OFF current (see Para. 0161).

o. Regarding claims 39 and 40, Klauk teaches that the contacts, which includes the first and third electrodes include conductive metals (see Para. 0059) and teaches a non-limiting example of aluminum for this purpose (see Para. 0059, Lines 12-14 and 41-44) without explicitly teaching gold as the material in the first and third electrodes. However, Klauk also teaches that gold and aluminum are functionally equivalent conductive metals for contacts (see Para. 0043). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use gold as the first and third electrodes since Klauk teaches that these materials are functionally equivalent to aluminum as conductive

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metals for contacts. It has been held that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

p. Regarding claims 36 and 37, the language of the claim is directed towards the process of making the electronic component of claim 38. It is well settled that "product by process" limitations in claims drawn to structure are directed to the product, per se, no matter how actually made. *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also, *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wethheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); *In re Marosi et al.*, 218 USPQ 289; and particularly *In re Thorpe*, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or otherwise. The above case law further makes clear that applicant has the burden of showing that the method language necessarily produces a structural difference. As such, the language claims 36 and 37 only requires the structure of the electronic device of claim 38, which does not distinguish the invention from Klauk in view of Mizusaki in view of Sirringhaus in view of Goodman, who teaches the structure as claimed. The claim does not add any additional structural features to the final device that are not already set forth by claim 38.

Allowable Subject Matter

6. Claims 2, 13 and 26 are allowed.

7. The following is a statement of reasons for the indication of allowable subject matter: A search of the prior art does not disclose or reasonably suggest a method for producing, on a substrate, an electronic component with closely adjacent electrodes, the method comprising: depositing a first metal layer onto the substrate; structuring a first photo lacquer on a surface of the first metal layer, wherein a portion of the surface of the first metal layer does not have the first photo lacquer thereon; etching the portion of the surface of the first metal layer not having the first photo lacquer; undercut etching the first metal layer so that an overhang is defined by the first photo lacquer; exposing, to a metal vapor, a surface of the first photo lacquer and an exposed portion of the substrate where the first metal layer was etched away so that a second metal layer is formed on the surface of the first photo lacquer and the exposed portion of the substrate where the first metal layer was etched away except in a space between the overhang and the substrate; and removing both the first photo lacquer and the second metal layer formed on the surface of the first photo lacquer; etching a hole into the substrate at a position other than a position of the first metal layer and the second metal layer; depositing a third metal layer onto the substrate, the first metal layer, and the second metal layer; applying an insulator onto the third metal layer; applying an organic semiconductor onto the third metal layer and the insulator; and applying a sealing layer onto the organic semiconductor.

Response to Arguments

8. Applicant's arguments with respect to claims 19-25 and 27-40 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- i. Zaumseil (Appl. Phys. Lett., Vol. 82) teaches high resolution organic transistors with nanometer scale gaps between the source and drain;
- ii. Bonfiglio ('954) and Shi ('640) each teach organic transistors with the edges of the gate electrode aligned with respective edges of the source and drain;
- iii. Jackson ('572) teaches organic transistors with transparent organic semiconductor, gate insulator and substrates.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW W. SUCH whose telephone number is (571)272-8895. The examiner can normally be reached on Monday - Friday 9AM-5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kiesha Bryant can be reached on (571) 272-1844. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Matthew W. Such/
Primary Examiner, Art Unit 2891